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ABSTRACT

This study investigated the effect of active participation in a story reading on children's understanding of false belief. Children, ages 38-63 months, were assigned to a participation or non-participation group. Participating children engaged in a book-reading process using puppets to respond to the story. Non-participating children were read the same story. All children completed the Peabody Picture Vocabulary Test-Revised to measure receptive language ability, and a traditional false-belief task. Results showed that age did not significantly affect the narrative task, but both verbal ability and type of participation were important. More children in the participation group than in the non-participation group demonstrated an understanding of false belief in the narrative task. (Author/JPB)

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Monsters, Bananas and Seaweed: Active Participation and Young Children's Understanding of False Belief

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ABSTRACT

The current study investigated if active participation was an important variable for young children when they were demonstrating an understanding of false belief. A sample of 109 children aged between 38 and 63 months (60 female, 49 male) were randomly assigned into a participation or a non-participation group. Each child in the participation group was given two puppets which resembled the main characters in a story, *Monster Bananas*, which was read to each child. At appropriate points during the reading each child in the participation group was instructed to put pretend seaweed on the puppets, and to roar like the monsters presented in the story. Children in the non-participation group were read the same story but did not have puppets and did not make monster sounds. All children also completed the Peabody Picture Vocabulary Test-Revised (PPVT-R) which provided a measure of their receptive language ability and a traditional false belief task.

While age was not found to be significant, both verbal ability and type of participation were found to be important variables for the narrative based task. More children in the participation group than the non-participation group were able to demonstrate their understanding of false belief in the narrative task.

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INTRODUCTION

Over the past decade much theory of mind research has focused on when such an understanding develops in young children (e.g., Astington & Gopnik, 1988; Wellman, 1990). However, recently a number of researchers have suggested that an understanding of the mind is influenced by social contexts and have begun to

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explore the implications of this understanding within everyday situations. For example, a relationship has been identified between a theory of mind and the following variables: peer popularity (Dockett, Szarkowicz, Petrovski, Degotardi & Rovers, 1999), family size (Jenkins & Astington, 1996), and talk about mental states within family contexts (Dunn, 1994). Indeed, some researchers have even suggested that an understanding of the mind develops as a consequence of the apprenticeships children enter with more experienced individuals (Lewis, Freeman, Kyriakidou, Maridaki-Kassotaki & Berridge, 1996). These individuals guide children through social proceedings by demonstrating appropriate actions and providing opportunities for children to practice their new understandings. Hence, there is a growing acknowledgment that the social contexts children engage in appear to be significant in the development of an understanding of mind.

Despite growing evidence which suggests that social contexts are important for the development of an understanding of the mind, empirical methods have remained the dominate approach in theory of mind research. However, many empirical, formal studies have been criticised for presenting children with contrived stories and unfamiliar contexts (Raver & Leadbeater, 1993). While some researchers have maintained a strong empirical focus in their studies, others have begun exploring children's understanding in everyday situations through less formal, observational methods. Varying results have been reported from these studies using less formal methods and empirical research, with children generally being identified demonstrating an understanding of mind at an earlier age when informal methods have been utilised (e.g., Hughes & Dunn, 1997; Szarkowicz, In press). Given these results, the current study aimed to present children with a task which enable key variables to be controlled, but was less formal than many previous empirical investigations for the following reasons. Firstly, the task materials for this study were all commercially available and designed specifically for preschool aged children. Hence, the story was not written with the intent of focusing on false belief understanding, but rather, just as humorous story for sharing with young children. Therefore, it could be suggested that the story was the type which children would encounter during their everyday activities. Secondly, the action of sharing literature was one which all children in the study engaged in regularly at their preschool, so was a familiar interaction which children understood the procedures for. Finally, all of the tasks in the current study were undertaken at the subjects' preschool, and hence, enabled children to remain in an environment which they felt a sense of control in, especially given all had been attending the preschool for a minimum of four months at the time of data collection.

While evidence suggests that social contexts are important in the development of an understanding of the mind, it is not clear which characteristics scaffold young children in their attempts to demonstrate their understanding. The research reported here attempts to provide an insight into how active participation can support children in a narrative based false belief task. Recently it was reported

that more children were able to demonstrate their understanding of false belief in a narrative based task when they regularly retold the main events of the story (Lewis, Freeman, Hagestadt & Douglas, 1994). In contrast, no improvement in performance appeared to have been availed when the same children were merely read the story twice. It has been suggested that by asking children to retell the events of a story that they are more able to identify what action and mentality is important (Lewis, 1994). Hence, by retelling events children are able to link the action and mentality into a coherent narrative. Given nonverbal memory has not been found to significantly influence performance on false belief tasks (Jenkins & Astington, 1996), it appears children need to construct a coherent representation of events rather than recall isolated details. If children are provided with an opportunity to actively participate in a false belief task they may find it easier to construct a coherent narrative of the events because of their involvement in the action.

The current study

The following predictions were made for the current study:

-more children would demonstrate an understanding of false belief when actively participating in the task than when not

-age was not expected to be an important predictor of performance

-more children would demonstrate an understanding of false belief during the narrative based false belief task than the traditional false belief task

METHOD

Subjects

Sample = 107 children (female = 59, male = 48)

Age = 38 months to 63 months (x = 54 months)

Setting

A single preschool in regional Australia.

Groupings

Children were randomly assignment into two groups:

54 in a non-participation group (mean age 54 months)

53 in a participation group (mean age 53 months)

Materials

The book *Monster Bananas* (Hopkinson, 1994) from the Bananas in Pyjamas series was selected for use in this study. The Bananas in Pyjamas are human sized characters who regularly appear on children's television in the country where this

research was undertaken. As a consequence of this, all children in the current study recognised the story characters.

The story *Monster Bananas* involved the Bananas in Pyjamas finding some seaweed on the beach. When they put the seaweed over their bodies they realised that they looked like sea monsters and decided to play a trick on their friends, the teddies, Morgan, Lulu and Amy. The Bananas in Pyjamas laid on the sand covered in seaweed and made monster sounds when each of the teddies visited the beach. Each teddy did not recognise the Bananas and believed that there was a sea monster on the beach. It was only when Amy attempted to take a photograph of the monsters, and dazzled the Bananas with the flash, that the true identity of the monsters was realised. Hence, the false belief was that the teddies believed there was a sea monster on the beach when the monster was really the Bananas in Pyjamas. To accompany the story two commercially available finger puppets of the Bananas in Pyjamas were used for the participation group.

In addition to the Bananas in Pyjamas task the Peabody Picture Vocabulary Test-Revised (PPVT-R) was undertaken to provide a control for receptive language ability. A traditional false belief task utilising a candle which looked like a cake was also completed.

Procedure

Prior to undertaking the PPVT-R and *Monster Bananas* tasks, children completed a traditional false belief task. Children were shown a candle which looked like a cake and asked the following questions:
"What do you think this is? (*A cake*). What is it really? Is it a cake or is it a candle? (*A candle*). When you first saw this what did you think it was? (*A cake*). But now what do you know it really is? Is it a real cake or a real candle? (*A candle*)."

All the data was collected on an individual basis with children being randomly assigned to either a participation or non-participation group for the *Monster Bananas* task. The only difference in procedure between each group for the *Monster Bananas* task was the method of presentation. Children in the non-participation group were read the story with no elaboration on the text beyond what was presented on each page. No props were provided for children in this group. In contrast, children in the participation group were presented with two Bananas in Pyjamas finger puppets before the story was read. Children were allowed to play with these puppets for a few minutes before the story was started and held the puppets during the reading. At the appropriate point in the story the children were asked to put the pretend seaweed on their puppets so the Bananas resembled the sea monsters in the book. This action was intended to physically reinforce the appearance-reality distinction which was occurring in the story, whereby the Bananas in Pyjamas appeared to be sea monsters but under the seaweed were still the Bananas. In addition to the puppets, children in the participation group also

made monster noises as indicated in the story. When a teddy came to the beach the Bananas roared. The researcher demonstrated this for the first encounter and asked children if they could roar like monster bananas. Children were then asked what the Bananas did each time a teddy came to the beach as presented in the book. At the end of the story children took the pretend seaweed off the Bananas. Children in both groups were asked the questions in Table 1.

The following variables were generated from the data. Firstly, all children who failed the control question on the *Monster Bananas* task were excluded. The three false belief questions for *Monster Bananas* were dummy coded: a score of one for a correct response and a score of zero for an incorrect response. Children had to answer both parts of each question to be scored as one. The three false belief questions were combined to form a total out of three. This total was then recoded so children who scored three were coded as one, and those children with less than three as zero. This new total was referred to as the false belief total. Thus, children had to respond correctly to all three false belief questions to be correct on the false belief total. Secondly, responses to the traditional false belief were also dummy coded: one for a correct response and zero for an incorrect. Finally, raw PPVT-R scores were the verbal ability variable.

Table 1

Questions for the *Monster Bananas* task

Type of question	Question
Control	What does the thing on the beach look like?
False belief	What does Morgan think is on the beach? What do you know is really there?
False belief	What does Lulu think is on the beach? What do you know is really there?
False belief	What does Amy think is on the beach? What do you know is really on the beach?

RESULTS

Receptive language ability results

PPVT-R scores: range 59 to 137, mean = 109, SD = 12

False belief results

No children failed the control question. The distribution of responses for the *Monster Bananas* and traditional false belief tasks are presented in Table 2.

In summary, 55% of children were able to demonstrate their understanding of false belief during the traditional task, 66% during the non-participation *Monster Bananas* task, and only 92% during the participation.

Table 2

Distribution of responses for *Monster Bananas* and traditional tasks

Non-participation			Participation		
Monster Bananas Task			Monster Bananas Task		
	Incorrect	Correct		Incorrect	Correct
Traditional			Traditional		
Incorrect	12	12	Incorrect	4	19
Correct	6	23	Correct	0	29

Partial Correlations

Partial correlations controlling for age and verbal ability indicated a significant correlation between the following variables:

-participation type and false belief total ($r = .312$, $p = .001$)

-false belief total and traditional total ($r = .219$, $p = .027$).

Logistic Regression Analysis

These relationships were explored further through a series of logistic regression analyses. A number of models were tested using the false belief total as a dependent variable with participation type and verbal ability as independent variables:

-Model 1 age ($r = .000$, $p = .983$)

-Model 2 Step 1-verbal ability ($r = .177$, $p = .020$)

Step 2-participation ($r = .261$, $p = .002$)

Based on these results the most acceptable model was model 2 which indicated that the type of participation children experienced was a significant predictor of performance for the false belief total (See Table 3).

Table 3

Summary of results for *Monster Bananas* task logistic regression analysis

	b	S.E b	Wald	df	*p*	R	exp b	Cox	Nag
Verbal	.0700	.0277	6.3891	1	.0115	.2018	1.0725		
Partn	2.1359	.6652	10.3110	1	.0013	.2777	8.4648	.170	.265

Therefore, children who actively participated in the sharing of the story were more often able to demonstrate their understanding of false belief then those children who did not participate in the sharing. While verbal ability was also found to be a significant predictor of performance, age was not identified so.

DISCUSSION

In the current study active participation was identified as an important predictor of performance on the narrative based false belief task. An important action for children in the participation group was the placing of pretend seaweed on the Bananas in Pyjamas puppets. This process enabled children to see the puppets were always the Bananas in Pyjamas even when they wore their seaweed disguises. When considering the everyday activities that young children engage in, the act of dressing is significant both as a practical experience and as a play activity. It can be assumed that all children in this study engaged in some form of dressing-up because it was incorporated into the preschool program. Thus, most were probably familiar with the appearance and reality distinction that is associated with such an activity. This distinction can also be applied to the procedure of dressing- up the Bananas in Pyjamas in pretend seaweed. Children in the participation group were able to transform the Bananas into monsters at the beginning of the task and return them back to Bananas in Pyjamas at the end. Thereby, children were able to apply their knowledge from the dress-up activity to the *Monster Bananas* task making it a more meaningful and practical experience.

Given many children were successful in the current study when they participated in the *Monster Bananas* task but not in the traditional task, it would appear that there were some features in the *Monster Bananas* task which were assisting children in their attempts to demonstrate an understanding of false belief. While there was the obvious participation differences between the tasks, there was also an underlying difference in the theoretical perspective which influenced the study design. Those researchers who accept children do not have an understanding of the mind because they have failed traditional false belief tasks may not be considering the possibility that such an understanding can be as diverse as the contexts in which it can be explored. It is possible that the experiences and social contexts children encounter have a greater influence on their developing understanding of mind than has been previously acknowledged by advocates of the theory theory perspective (e.g., Gopnik & Wellman, 1992; Wellman, 1990). From an enculturation viewpoint, children who have not experienced contexts such as those presented in many traditional tasks may find it difficult to demonstrate an understanding of mind because they have not gathered the experiences needed to make the task meaningful. When confronted with an unfamiliar context, such as in a traditional false belief task, children require scaffolding from more experienced

individuals who can demonstrate appropriate actions (Lewis et al, 1996). This does not suggest children do not have the understandings needed for the context, but rather, that they are unsure of what actions are acceptable in the unfamiliar situation. If children are unable to seek assistance from other individuals about the new context they require the task to provide scaffolding by presenting elements which children are familiar with. For example, in the current study all children were scaffolded by the familiar characters in the selected story. Therefore, even if the events in the story were not familiar to the children, they knew the characters' personalities and how each character related to the others. This may explain why a greater percentage of children during the non-participation task, rather than the traditional task, were able to demonstrate an understanding of false belief.

The context adopted for investigations is perceived as being so important that enculturation theorists believe development can not be investigated outside of the social context in which it occurs (Astington, 1996). Therefore, if children are already developing their understanding of the mind within the contexts of literature and play, it would seem appropriate to use these contexts when creating investigative tasks. By using familiar contexts not only are children demonstrating if they do or do not have an understanding, but also insights into how this understanding is used during everyday activities can be explored. Moreover, familiar contexts can also provide children with a sense of control which can assist in attempts to demonstrate understanding (Hala & Chandler, 1996). It is possible that the sense of control children gained by participating in the *Monster Bananas* task made the experience appear more as an episode of play than as a research context. Indeed, the participation context enabled children to enter an apprenticeship with the researcher, whereby the introductory interaction between the researcher and child provided opportunities to explore an understanding of the mind. For example, the researcher was able to demonstrate appropriate actions for the child using the puppets who then modelled these as part of the task. These actions did not present children with answers to the researcher's questions, but rather, may have enabled the children to feel comfortable with the actions and focus on the mentality which the actions were a consequence of. As Lewis et al (1996) have suggested, children develop an understanding of mental states within social contexts where they are scaffolded by more experienced individuals. Unlike in the participation context, children in the non-participation context did not enter an apprenticeship with the researcher. Rather, children in the non-participation group were directed in the task by the researcher and were provided with little opportunity to explore their understandings in an interactive manner.

In conclusion, irrespective of age, most children in the current study were able to demonstrate their understanding of false belief when provided with an opportunity to actively participate in the narrative based task. While linguistic ability was a significant predictor of performance, the opportunity to participate in the task was identified as beirg more critical, suggesting social context is a very

important variable in the development, and demonstration of children's understanding of the mind.

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